

ANALOG-TO-DIGITAL CONVERTER UTILIZING A TIMER FOR INCREASED RESOLUTION

Abstract

An analog-to-digital converter includes a capacitor for storing charge and a current source for flowing current through the capacitor for charging the capacitor. The analog-to-digital converter also contains a switch for controlling flow of current from the current source to the capacitor, a comparator for outputting a first comparison value when an analog input voltage is approximately equal to a voltage across the capacitor, and a timer for calculating a charging period of time needed for the voltage across the capacitor to become equal to the analog input voltage. A controller is used for controlling operation of the switch, for starting the timer when the switch electrically connects the current source to the capacitor for charging the capacitor, for stopping the timer when the comparator outputs the first comparison value, and for converting the charging period of time calculated by the timer into a digital output voltage.